

# Unveiling The Hidden Eagle: Acute Parotitis-Induced Eagle Syndrome

Nitipong Permpalung, Promporn Suksaranjit, Daych Chongnarungsin, Charles L. Hyman

*Department of Medicine, Bassett Medical Center and Columbia University College of Physicians and Surgeons, Cooperstown, New York, USA*

## Abstract

**Context:** A cervicofacial pain and foreign body sensation in pharynx associated with styloid process elongation is called Eagle syndrome. Typically, this syndrome is provoked by tonsillectomy or trauma. We report the first case of acute parotitis-induced Eagle syndrome. **Case Report:** A 65-year-old woman presented with right facial pain. CT scan of neck revealed asymmetric enhancement of the right parotid gland compatible with acute parotitis. All inflammation was resolved with antibiotics. However, the patient complained of pain in right mandibular region out of proportion to inflammation. Review CT found to have an asymmetrically long right styloid process measures. The diagnosis of acute parotitis-induced Eagle syndrome was established. **Conclusion:** Physicians should have a high index of suspicion for Eagle syndrome in patients with atypical neck pain and elongated styloid process since another significant manifestation of Eagle syndrome is carotid artery compression leading to recurrent syncope or stroke.

**Keywords:** Eagle syndrome, Neck pain, Parotitis

**Address for correspondence:** Nitipong Permpalung, Department of Medicine, Bassett Medical Center and Columbia University College of Physicians and Surgeons, One Atwell Road, Cooperstown, New York, USA, 13326. E-mail: nitipong.permpalung@bassett.org.

## Introduction

Eagle syndrome is an uncommon disease associated with elongation of the styloid process. Typical Eagle syndrome is usually provoked by tonsillectomy or trauma. Here, we report the first documented case of acute parotitis-induced Eagle syndrome.

## Case Presentation

A 65-year-old woman with past medical history of diabetes mellitus, chronic kidney disease presented with a five day history of right facial pain and swelling that started after a right upper first premolar root canal procedure. The pain and swelling progressed despite treatment with amoxicillin/clavulanate to the point

that she could not open her mouth due to severe right facial pain. She denied fever, sinus pain, ear pain, nasal discharge, tongue swelling, breathing difficulty, voice change or drooling but did have chills. Physical examination demonstrated erythema, painful swelling in the preauricular area extending to the right mandibular angle. There was no purulent discharge from the orifice of Stensen's duct on the right. Temporary amalgam was seen on the right upper first premolar without swelling or tenderness at the dental root. Otoscopic examination was within normal limits bilaterally. Pertinent laboratory investigation revealed a white blood cell 7.7 (neutrophil 73.6%, lymphocyte 15.7%, monocyte 9.5%), amylase 81 U/l, and negative blood cultures. Neck and sinus computed tomography (CT) scan revealed asymmetric enhancement of the right parotid gland compatible with acute parotitis [Figure 1a]. No calculus, mass, or abnormal collection was identified. The sub-mandibular glands were unremarkable, and para-pharyngeal fat was preserved. The patient was treated with intravenous ceftriaxone and clindamycin. The inflammation almost completely subsided to the point that patient could open her mouth. However, patient started to complain of pain in right mandibular, ear, and neck region with foreign sensation in her

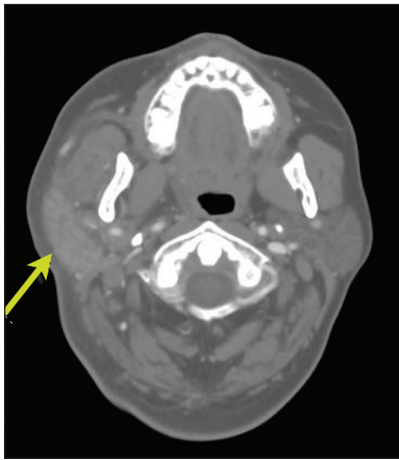
### Access this article online

#### Quick Response Code:



Website:  
[www.najms.org](http://www.najms.org)

DOI:  
10.4103/1947-2714.127753

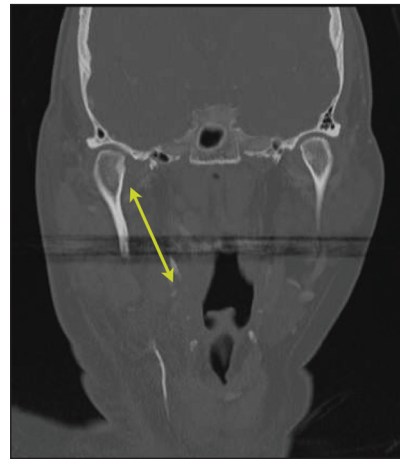


**Figure 1a:** Neck and sinus computed tomography (CT) scan revealed asymmetric enhancement of the right parotid gland compatible with acute parotitis

throat. The pain was felt to be out of proportion to the inflammation by examination. The patient denied a history of recurrent head and neck pain, syncope, or stroke in the past. CT was reviewed with the radiologist and found to have an asymmetrically long right styloid process measures 5.3 cm in length [Figure 1b]. The patient was diagnosed with acute parotitis-induced Eagle syndrome and was referred to maxillofacial surgeon for further treatment.

## Discussion

Typical Eagle syndrome including cervicofacial pain, otalgia, and foreign body sensation in the pharynx was first described in 1937. Eagle W *et al.* reported that any styloid process longer than 25 mm could explain the symptoms.<sup>[1]</sup> Based on literature review, Eagle syndrome is usually aggravated by tonsillectomy or trauma;<sup>[2,3]</sup> however, to the best of our knowledge, this is the first report of Eagle syndrome provoked by acute parotitis. Steinman proposed 3 theories explaining etiologies of styloid ossification: Post-traumatic healing process, metaplastic changes involving a traumatic stimulus, and congenital elongation of styloid process.<sup>[4]</sup> Since our patient denied all history of trauma or tonsillectomy and it is too soon for acute parotitis to stimulate any calcification or metaplasia within a few days from the onset of the disease, we believe her elongated styloid process is likely to be congenital process. The elongation styloid process due to ectopic calcification in end-stage kidney disease patient has been proposed.<sup>[5]</sup> However, this theory is less likely to explain in our case since the patient has early stage of chronic kidney disease (estimated creatinine clearance was 65 ml/min) without secondary hyperparathyroidism or abnormal serum calcium level. Although the pathophysiology of pain in Eagle syndrome is still debated, impingement of cranial



**Figure 1b:** An asymmetrically long right styloid process measures 5.3 cm in length

nerves V, VII, IX, and X or sympathetic nerves within carotid sheath by granulation tissue, insertion tendonitis, or post-tonsillectomy scarring have been thought to be the reasons.<sup>[6-8]</sup> The authors hypothesize it is possible that local inflammation from acute parotitis and soft tissue swelling might cause cranial nerves impingement and provoke this syndrome. The treatment options include oral analgesics or local infiltration with anesthetic agents. Resection of the styloid process is indicated in cases of intractable pain despite medications.

Another clinically significant manifestation of Eagle syndrome is stylocarotid manifestation caused by compression of carotid artery by elongated styloid leading to recurrent dizziness, syncope, or stroke.<sup>[9]</sup> In this case, styloidectomy is clearly indicated. Physicians should have a high index of suspicion for Eagle syndrome in patients with atypical neck pain and elongated styloid process on neck imaging, since it may significantly alter management compared to common conditions.

## References

1. Eagle WW. Symptomatic elongated styloid process: Report of two cases of styloid process-carotid artery syndrome with operation. *Arch Otolaryngol* 1949;49:490-503.
2. Leong SC, Karkos PD, Papouliakos SM, Apostolidou MT. Unusual complications of tonsillectomy: A systematic review. *Am J Otolaryngol* 2007;28:419-22.
3. Koivumäki A, Marinescu-Gava M, Järnstedt J, Sándor GK, Wolff J. Trauma induced eagle syndrome. *Int J Oral Maxillofac Surg* 2012;41:350-3.
4. Steinmann EP. Styloid syndrome in absence of an elongated process. *Acta Otolaryngol* 1968;66:347-56.
5. Gokce C, Sisman Y, Sipahioğlu M. Styloid process elongation or Eagle's Syndrome: Is there any role for ectopic calcification? *Eur J Dent* 2008;2:224-8.
6. Chuang WC, Short JH, McKinney AM, Anker L, Knoll B, McKinney ZJ. Reversible left hemispheric ischemia secondary to carotid compression in Eagle syndrome: Surgical and

- CT angiographic correlation. *AJNR Am J Neuroradiol* 2007;28:143-5.
7. Keur JJ, Campbell JP, McCarthy JF, Ralph WJ. The clinical significance of the elongated styloid process. *Oral Surg Oral Med Oral Pathol* 1986;61:399-404.
  8. Murtagh RD, Caracciolo JT, Fernandez G. CT Findings associated with Eagle Syndrome. *AJNR Am J Neuroradiol* 2001;22:1401-2.
  9. Todo T, Alexander M, Stokol C, Lyden P, Braunstein G, Gewertz B. Eagle syndrome revisited: Cerebrovascular complications. *Ann Vasc Surg* 2012;26:729.e1-5.

**How to cite this article:** Permpalung N, Suksaranjit P, Chongnarungsin D, Hyman CL. Unveiling the hidden eagle: Acute parotitis-induced eagle syndrome. *North Am J Med Sci* 2014;6:102-4.

**Source of Support:** Nil. **Conflict of Interest:** None declared.

### Staying in touch with the journal

**1) Table of Contents (TOC) email alert**

Receive an email alert containing the TOC when a new complete issue of the journal is made available online. To register for TOC alerts go to [www.najms.org/signup.asp](http://www.najms.org/signup.asp).

**2) RSS feeds**

Really Simple Syndication (RSS) helps you to get alerts on new publication right on your desktop without going to the journal's website. You need a software (e.g. RSSReader, Feed Demon, FeedReader, My Yahoo!, NewsGator and NewzCrawler) to get advantage of this tool. RSS feeds can also be read through FireFox or Microsoft Outlook 2007. Once any of these small (and mostly free) software is installed, add [www.najms.org/rssfeed.asp](http://www.najms.org/rssfeed.asp) as one of the feeds.